

**What is claimed is:**

1. An apparatus for tracing a GTP resource, comprising:
  - a call tracing unit which receives a call tracing command from an operator through an MMI and performs a call tracing function in response;
  - a call tracing DB which stores call-tracing data currently processed;
  - a GTP-U tracing unit which traces a GTP-U message and reporting the GTP-U message to the call tracing unit;
  - a SGSN interface unit which receives the GTP-U message outputted from the SGSN; and
  - an internet interface unit which transmits the GTP-U message routed at the GTP-U tracing unit to an internet network.
2. The apparatus of claim 1, further comprising:
  - a call manager which sets a call for a subscriber, searches whether GTP-C tracing function for the subscriber is set in the tracing information DB when receiving the GTP-C, and transmits a corresponding GTP resource information to the call tracing unit when the corresponding GTP-C tracing function is set.
3. The apparatus of claim 1, wherein the GTP-U tracing unit comprises:

a call tracing interface unit which processes a GTP-U tracing function message requested from the call tracing unit and transmits a result of the GTP-U data tracing;

a TEID converter which converts an IMSI or IP received from the call tracing interface unit to a TEID;

a trace load controller which reduces a load of an exchanger, wherein the load is generated from the GTP-U data tracing function;

a GTP-U traffic detector which detects a traffic for tracing the GTP-U between the SGSN interface unit and the internet interface unit; and

a GTP-U tracing DB which stores IMSI information for mapping the TEID and information for the GTP-U tracing.

4. A method for tracing a GTP resource, comprising:

setting a tracing function for at least one reserved resource of a GTP-U by using a TEID for a subscriber to be traced; and

outputting information for the reserved resource by detecting the GTP-U having the tracing function set therein.

5. The method of claim 4, wherein setting the tracing function comprises:

receiving tracing information for the subscriber from an operator;  
mapping the TEID allotted to the subscriber using the tracing information; and  
registering the tracing function of the GTP-U using the TEID; and  
storing the TEID together with the tracing information to a tracing information DB.

6. The method of claim 5, wherein the tracing information includes at least one of an IMSI and an IP address of the subscriber.

7. The method of claim 6, wherein the tracing information comprises a predetermined number of bits indicating a SGSN record type and a tracing type for classifying call watching, call tracing, and the user message tracing according to the SGSN record type.

8. The method of claim 5, wherein the tracing information DB stores the tracing information, the TEID, and a trace count value notifying the number of the traced message.

9. The method of claim 4, wherein outputting information for the reserved resource information comprises:

receiving and storing the TEID related to the registration of the GTP-U tracing function and the tracing information in a tracing information DB;

activating a tracing flag corresponding to the TEID;

confirming a TEID of the GTP-U trafficked between the SGSN and the GGSN;

confirming whether the tracing flag corresponding to the confirmed TEID is activated by searching the TEID table; and

outputting the reserved resource information of the GTP-U to the operator by using the TEID.

10. The method of claim 9, wherein the reserved resource information comprises an AMA number of trafficked subscriber message, an interface number, a VPI/VCI, a link band, a value directing a stream direction of the data, and the trace count value.

11. The method of claim 9, wherein outputting the reserved resource information comprises:

confirming whether the TEID is stored by searching the tracing information DB;

mapping the reserved resource information to a subscriber tracing information corresponding to the TEID ;

outputting the mapped subscriber tracing information to the operator when the TEID is stored;

increasing a trace count value in the tracing information ;

comparing the trace count value with a trace critical value; and

deleting the TEID and the tracing information in the tracing information DB when the trace count value is the same as the trace critical value.

12. The method of claim 4, further comprising:

operating a timer corresponding to a tracing function the duration when the tracing information includes information of the tracing function duration.

13. The method of claim 12, further comprising:

of canceling the GTP-U tracing function by deleting the TEID and the tracing information from the tracing information DB when the timer is terminated.

14. The method of claim 4, further comprising:

canceling the GTP-U tracing function when the subscriber call is canceled.

15. The method of claim 14, wherein canceling the GTP-U tracing function comprises:

transmitting a session termination signal including an identification information of subscriber whose call is cancelled; and

canceling the GTP-U tracing function by deleting the TEID and the tracing information from the tracing information DB using the identification information.

16. A method for tracing a GTP resource, the GTP trafficked between a SGSN and a GGSN at an exchanger including the SGSN and the GGSN having a call tracing unit, a call manager, a tracing information DB, and GTP-U tracing unit, said method comprising:

setting a tracing function for reserved resource of a GTP-U using TEID of a subscriber to be traced;

detecting the GTP-U having the tracing function set therein; and

outputting information for the reserved resource of the GTP-U message.

17. The method of claim 16, wherein setting the tracing function comprises:

Sending a request for GTP-U tracing function registration to the GTP-U tracing unit by transmitting tracing information for a subscriber received from an operator to the GTP-U tracing unit;

mapping the TEID allotted to the subscriber using the tracing information;  
registering the GTP-U tracing function using the TEID;  
transmitting the TEID to the call tracing unit; and  
storing the TEID together with the tracing information in the tracing information DB.

18. The method of claim 17, further comprising: transmitting a response message to the request of the GTP-U tracing function registration to the call tracing unit after the request is sent.

19. The method of claim 18, further comprising: reporting a failure of the GTP-U tracing function registration to the operator when there is no response message to the request of the GTP-U tracing function registration from the GTP-U tracing unit within a predetermined time.

20. The method of claim 17, wherein further comprises:  
transmitting a response message for notifying a failure of the GTP-U tracing function registration from the GTP-U tracing unit to the call tracing unit; and  
reporting the failure of the GTP-U tracing function registration from the call tracing unit to the operator when the GTP-U tracing unit confirms that the call for the subscriber does not exist by mapping the TEID allotted to the subscriber.

21. The method of claim 17, wherein the tracing information comprises an IMSI and IP address of the subscriber.

22. The method of claim 21, wherein the tracing information comprises a predetermined number of bits indicating SGSN record type and a tracing type for classifying call watching, call tracing, and GTP-U tracing according to the SGSN record type.

23. The method of claim 17, wherein the tracing information DB stores the tracing information, the TEID, and a trace count value notifying the number of the traced message.

24. The method for tracing GTP resource of claim 17, wherein mapping comprises:  
converting the tracing information (INSI or IP) received from the call tracing unit to the TEID; and  
storing the converted TEID and the tracing information at the GTP-U tracing unit; and  
activating a tracing flag corresponding to the TEID.



25. The method of claim 16, wherein outputting the reserved resource information comprises:

confirming the TEID of a trafficked GTP-U at the GTP-U tracing unit;

confirming whether a tracing flag of the TEID is activated by searching the table with the confirmed TEID at the GTP-U tracing unit;

transmitting information for the reserved resource of the GTP-U together with the TEID from the GTP-U tracing unit to the call tracing unit when the tracing flag is activated; and

outputting the reserved resource information from the call tracing unit to the operator using the TEID.

26. The method of claim 25, wherein the reserved resource information comprises an AMA number of the trafficked GTP-U, an interface number, VPI/VCI, a link band, a value directing a stream direction of the data, and a trace count value.

27. The method of claim 25, wherein outputting the reserved resource information to the operator comprises:

confirming whether the TEID received from the GTP-U tracing unit is stored by searching the tracing information DB;

mapping a subscriber tracing information corresponding to the TEID with the reserved resource information; and

outputting the mapped resource information to the operator when the TEID is stored;

increasing a trace count value in the call tracing information; and

comparing the trace count value with a trace critical value; and

deleting the TEID and the tracing information from the tracing information DB when the trace count value is the same as the trace critical value.

28. The method of claim 27, wherein the comparison of trace count value and trace critical value is separately carried out for each of up stream and down stream, and the TEID and the tracing information are deleted from the tracing information DB when the trace count value of one of the up/down stream and the trace critical value are equal.

29. The method of claim 17, further comprising:

operating a timer corresponding to a tracing function duration at the call tracing unit when the TEID is received if the tracing information has information of the tracing function duration.

30. The method of claim 29, further comprising:

canceling the GTP-U tracing function by deleting the TEID and the tracing information from the tracing information DB when the timer is terminated.

31. The method of claim 16, further comprising:

call tracing unit canceling the GTP-U tracing function when the call of the subscriber is canceled.

32. The method of claim 31, wherein canceling the GTP-U tracing function comprises:

transmitting a session termination signal having an identification information of the subscriber whose call is canceled from the call manager to the call tracing unit; and

canceling the GTP-U tracing function by deleting the TEID and the tracing information from the tracing information DB using the identification information at the call tracing unit.